Comparison of the Accuracy of Transvaginal Sonography and Hysteroscopy for the Diagnosis of Endometrial Polyps at Rajavithi Hospital

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Objective: *To compare the accuracy of Transvaginal Sonography (TVS) and Hysteroscopic diagnosis (HD) for diagnosis of endometrial polyp diseases.*

Material and Method: *A retrospective study was conducted and based on the medical records of endometrial polyp patients who were submitted to histological diagnosis during January 1st, 2005-December 31st, 2010 at Rajavithi Hospital. Apart from histological findings which are final, all patients had been submitted to both TVS and HD tests. The statistical analysis considered percentage,sensitivity, specificity and accuracy and compared the accuracy effectiveness of TVS and HD.*

Results: *The present study examined sixty endometrial polyp patients who were women whose mean age was 31-40 years. Sensitivity,specificity and accuracy for diagnosis of endometrial polyps by TVS were 60%, 33.3% and 57.6%, respectively where as those by HD were 93.3%, 33.3% and 87.9%, respectively. The present study noted that the HD showed superior accuracy compared to TVS (P<0.001) in the endometrial polyp diagnosis.*

Conclusion: *Particularly, for endometrial polyp diagnosis, hysteroscope was more sensitive and accurate than transvaginal sonography.*

Keyword: *Hysteroscopic diagnosis, Transvaginal sonography, Endometrial polyp*

J Med Assoc Thai 2012; 95 (Suppl. 3): S92-S97
Full text. e-Journal: *http://www.jmat.mat.or.th*

Abnormal uterine bleeding is found throughout the reproductive age[1], 33.0% of them found in symptomatic premenopausal women, and 10.0% were asymptomatic[2]. Management depends on the symptoms and causes. As known, endometrial polyps can be regressed themselves, some patients improved, however, some experienced the recurrence and it is quite difficult to be diagnosed. To rule out the diagnosis, additional physical examination must be continued such as transvaginal sonography (TVS), curettage, for instance.

Hysteroscope is a new method for intrauterine evaluation. Many studies showed that this procedure can be chosen instead of TVS and curettage[3] because its accurate evaluation of the uterine cavity in order to provide treatment correctly for patients. However, it could not be used as the gold standard at Rajavithi Hospital due to the insufficiency of meticulous skills among endoscopists in the hospital and it needs a long learning curve prior to execution. As such some patients may obtain unsuitable management.

Endometrial polyps is the most common cause of abnormal vaginal bleeding both in pre and post menopausal women. Prevalence of endometrial polyps varies widely with its range of 7.8%-34.9%[4]. Most endometrial polyps were benign and they are reported with malignant transformation developing around 0%-12.9%[4]. The risk was high for the cases with postmenopausal status, large polyp with a size greater than 1.5 cm, as well as hypertension and tamoxifen taken. Based on the present study, during the past several years, patients who presented with abnormal uterine bleeding were diagnosed with multimodality of investigations. However, the first two popular methods were curettage and transvaginal sonography.

Types of investigations used depend on age, menopausal status, hypertension and hormonal treatments. Transvaginal sonography is non-invasive and convenient technique but provides low accuracy

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when compared with the saline infusion sonohysterography (SIS) and hysteroscopic examinations[5,6]. Curettage was performed for acquiring histological results that was final, but it is very invasive and may damage endometrial layers resulting in infertility. Another method used was Endocell endometrial biopsy. The limitation of both curettage and biopsy techniques was that it was hard to collect the right endometrial tissues. Sometimes, it could not indicate completely the cause of abnormal vaginal bleeding, especially for multiple, large, long and fragile polyps, especially in the case with intrauterine adhesions.

In case that it was not able to be ruled out due to intrauterine adhesions and intrauterine mass[7]. That was a further indication for hysteroscopic diagnosing, physicians then performed the HD as the second step. Eventually, when it was again unsure results, the endometrial biopsy was performed as a histological diagnosis.

Investigators aim to achieve new and appropriate technique for precise endometrial polyps and intrauterine evaluation. Besides, the technique should be safe without unnecessary curettage. Comparison of TVS and HD is one of effective methods to select good investigation for endometrial polyps diagnosis. Histological endometrial findings are the gold standard. So the present study was designed to compare the accuracy of transvaginal sonography (TVS) and hysteroscopy (HD) in diagnosis of endometrial polyps.

Material and Method

The present study was approved by the Research Ethics Committee of Rajavithi Hospital. A retrospective analysis of data was conducted from the medical records of women who were histologically diagnosed with endometrial polyps at Rajavithi Hospital from 1st January 2005 to 31st December 2010. The inclusion criteria were patients who were treated at the gynecological clinic, Rajavithi Hospital, diagnosed of endometrial polyps by histological tests and underwent both TVS and HD, then followed-up by endometrial biopsy. The exclusion criteria were patients who were diagnosed of endometrial polyps by other methods except histological tests, final diagnosis of endometrial cancer and were neither investigated nor diagnosed at the gynecological clinic, Rajavithi Hospital. These women underwent transvaginal sonography after the initial indications of abnormal vaginal bleeding, menstrual problems, abnormal findings on a physical examinations and pelvic pain.

Various ultrasound machines were used in performing transvaginal sonography, *e.g.* Aloka, GE, etc., which were equipped with the range of 5-10 MHz transvaginal probe. These machines are top of the range, so minor variations of different machines do not influence the final results. The physician performed all ultrasound examinations and measurements by having uterus measured in sagittal and coronal planes. Endometrial cavity was evaluated and noted down abnormalities such as the echo patterns of fluids within endometrium, the presented alterations in another uterine or ovarian pathology, the presented endometrial thickness of more than 0.8 cm in premenopausal women, and more than 0.4 cm in postmenopausal women.

Hysteroscopy was performed by posting the patient in dorsal lithotomy position, then inserting a speculum into the vagina to distend the cervix and using povidine-iodine solution to clear away the external os. Flexible hysteroscope was then inserted in the cervix for examining and recording the appearance of endometrium as well as the presence of polyps, fibroids, and synechiae. All of the procedures was performed by an endoscopist at the gynecological clinic, Rajavithi hospital. In addition, further reports from the pathological department on endometrial pathology such as biopsy and curettage were brought into the comparison. At the end, all reports from the ultrasound, hysteroscopy and histology findings were comparatively evaluated.

The selected sample was taken from those who got the final diagnosis of endometrial polyps. All of their basic data were grouped and analyzed for statistical evaluation. The basic data included clinical presentation, age, parity, menstruation status, hormonal treatment, BMI and underlying diseases. Each of TVS and HD was calculated in percentages. Sensitivity, specificity and accuracy were analyzed and compared one by one. It is a significant result that the p-value was less than 0.001.

Results

Based on histological results, sixty women included in the present study, were diagnosed with endometrial polyps and the mean age was 31-40. All basic data were taken into the analysis such as clinical presentation, age, parity, menstruation status, BMI and underlying disease as shown in Table 1. Metrorrhagia and hypermenorrhea were predominance symptoms in endometrial polyps.

Based on the present study, as shown in Table

2, among 60 endometrial polyp patients, only 36 of them were correctly diagnosed with TVS, comparing to HD test which correctly diagnosed up to 56 of them. Eventually, the endometrial polyp diagnosis was confirmed by histological examination of the specimen in all 60 cases. All data derived were brought into the analysis of sensitivity, specificity, accuracy, positive predictive value (PPV) and negative predictive value (NPV) as shown in Table 3.

Regarding Table 3, the findings from TVS showed that sensitivity, specificity and accuracy were 60.0%, 33.3% and 57.6% respectively. Whereas PPV and NPV were 90% and 7.7%. While, the HD findings were on the other hand, its sensitivity, specificity and accuracy were 93.3%, 33.3% and 87.9% respectively. While PPV was 93.3% and NPV was 33.3%. When comparing TVS and HD on sensitivity and accuracy, it is obvious that HD is more superior than TVS ($p < 0.001$) as shown in Table 3.

Table 1. Patients characteristics

Data	n = 60	%
BMI (kg/m^2)		
Less than 18.5	5	8.3
18.5-24.9	32	53.3
25-29.9	17	28.3
More than 30	6	10
Age(years)		
21-30	5	8.3
31-40	23	38.3
41-50	21	35
More than 51	11	18.3
Parity		
0	25	41.7
1-5	35	58.3
Menopause		
Yes	11	18.3
No	49	81.7
Contraception		
No	36	60
Pills	4	6.7
Other	20	33.3
Underlying disease		
None	45	75
DM+/-HT	7	11.7
Other	8	13.3
Clinical presentations		
Metrorrhagia	29	48.3
Menorrhagia	4	6.7
Hypermenorrhea	27	45

BMI = Body Mass Index, DM = Diabetes mellitus, HT = Hypertension

Discussion

Hysteroscopy is micro-invasive procedure that investigators can see entirely from the vagina, endocervical canal, endometrial cavity and ostium. At Rajavithi Hospital, during these several years, hysteroscopy has been performed for the cases of abnormal uterine bleeding, endometrial polyp, submucous myoma and infertility. Hysteroscopic results revealed the real cause of intrauterine lesions in these symptoms compared to TVS and curettage resulting in correct treatments, low rate of recurrence and the intrauterine evaluation can be performed conveniently.

Moreover, the present study reveals that hysteroscopic diagnosis is more efficacy than transvaginal sonography. From the statistical results, the endometrial polyp diagnosis based on TVS presented 60.0% sensitivity, 33.3% specificity and 57.6% accuracy. Meanwhile, the results from HD provided 93.9%, 33.3% and 87.9% of sensitivity, specificity and accuracy respectively.

HD results were far more precise than TVS which is in accordance with some previous studies. Such as Pasqualotto EB et al showed a retrospective study that reviewed diagnoses, complications and surgical finding in women treated for Abnormal uterine bleeding by operative hysteroscopy. The results show operative hysteroscopy was a safe out put procedures. But hysteroscopy and SIS were better diagnostic tests for intracavity than TVS and endometrial biopsy[6]. That is similar to two prospective studies, Grimbizis GF et al studied methods for diagnoses in 105 women with symptoms of menorrheagia,post menopausal bleeding and infertility. The present study showed hysteroscopy being found to have significant better diagnostic performance compared to SIS and TVS[8] whereas another study by, Schwarzler P et al, studied in 100 patients with abnormal uterine bleeding showed sensitivity and spectivity of hysterocopy was 90% and 91%, respectively, compared to sensitivity and spectivity of TVS were 67.0% and 89.0%[9]. The large systemic review study by, Farquhar et al reviewed common diagnotic images tests in nineteen studies showed sonohysterograghy and hysteroscopy performed better than TVS in detecting submucous fibroid[10]. According to Bingol et al[11] reported in their prospective study in 137 postmenopause bleeding patients with histology results as the goldstandard

Table 2. 60 Endometrial polyps were diagnosed with two investigation modality

Investigation	Endometrial polyps	Non-endometrial polyps	Histologic diagnosis*
TVS diagnosis	36	24	60
Hysteroscopic diagnosis	56	4	60

* Endometrial polyps were diagnosis from histologic reports

Table 3. Diagnostic performance of TVS and HD

TEST	Sensitivity	Specificity	PPV	NPV	DA	False positive	False negative
TVS	60	33.3	90	7.7	57.6	40	66.7
HD	93.3*	33.3	93.3*	33.3	87.9*	6.67	66.7

*$p < 0.001$
Sensitivity, Specitivity, positive predictive value (PPV), negative predictive value (NPV), false positive, false negative and diagnostic accuracy (DA) data are percentages

reported the comparison results between hysteroscopy, TVS and sonohysterography. Based on the report, sensitivity, specificity and PPV were 70.0%, 50.0% and 96.2% in TVS, while they were 92.3%, 80.7% and 80.9% in HD. Sensitivity, specificity and PPV were 89.7%, 77.3% and 95.3% in SIS.

Salim et al[5] a large reviewer of diagnostic modalities for endometrial polyps such as TVS,3-D TVS, saline infusion sonography (SIS), 3-D SIS, blind biopsy, diagnostic hysteroscopy, flexible hysteroscopy and hysterosalpingography found that sensitivity values of TVS and HD were 91.0% and 90.0%, specificity values of TVS and HD were 90.0% and 93.0% and PPV of TVS and HD were 86.0% and 96.0%, respectively. Unlike other studies, this paper presented very slightly different values in both methods. Another study recommended the combination of both TVS and HD usage for better results[12]. For high efficacy of endometrial polyps diagnoses, HD should be selected as the first method. Nonetheless, most of all, the decision depends on the patient's readiness and physician's capacity.

Otherwise, the present study shows the most common causes and some apparent facts of abnormal uterine bleeding which happened in endometrial polyps. The most frequent symptom was metrorrhagia (48.0%). No one in the present study was on tamoxifen; obesity which is one of endometrial polyp risks was not higher than other patients, for instance.

Because the present study is a retrospective study, data may not be collected completely, therefore the size of sample (sixty patients) was tentatively low for the 5-year study period. At the same time, some important data were missing such as endometrial thickness, patient tolerance, and complications. While some other studies which contained data on endometrial thickness, patient's tolerance and few complications could help predict intrauterine lesions better as these data were useful for diagnosis asymptomatic intrauterine mass[9,13].

There are multiple modalities for endometrial polyp diagnosis such as 3D transvaginal sonography, 3D SIS and gel instillation. Each technique has had a few studies but there might be a lot of progression in the near future. This will result in new and appropriate approaches for diagnosing.

Finally, hysteroscopy is a good investigation, especially when detecting endometrial pathology. Despite its expensiveness, this method is useful for patients with abnormal uterine bleeding, infertility and asymptomatic endometrial pathology. Physicians should select HD as an initial method for patients with such symptoms.

Conclusion

Apparently, hysteroscopy showed superior accuracy compared to TVS in the diagnosis of endometrial polyps. The further technique is office hysteroscopy which can be performed in an OPD unit and able to lower the number of curettage and unnecessary hormonal treatments.

Potential conflicts of interest

None.

References

1. Ryan GL, Syrop CH, Van Voorhis BJ. Role, epidemiology, and natural history of benign uterine mass lesions. Clin Obstet Gynecol 2005; 48: 312-24.
2. Clevenger-Hoeft M, Syrop CH, Stovall DW, Van Voorhis BJ. Sonohysterography in premenopausal women with and without abnormal bleeding. Obstet Gynecol 1999; 94: 516-20.
3. Gimpelson RJ. Office hysteroscopy. Clin Obstet Gynecol 1992; 35: 270-81.
4. Salim S, Won H, Nesbitt-Hawes E, Campbell N, Abbott J. Diagnosis and management of endometrial polyps: a critical review of the literature. J Minim Invasive Gynecol 2011; 18: 569-81.
5. Pasqualotto EB, Margossian H, Price LL, Bradley LD. Accuracy of preoperative diagnostic tools and outcome of hysteroscopic management of menstrual dysfunction. J Am Assoc Gynecol Laparosc 2000; 7: 201-9.
6. de Vries LD, Dijkhuizen FP, Mol BW, Brolmann HA, Moret E, Heintz AP. Comparison of transvaginal sonography, saline infusion sonography, and hysteroscopy in premenopausal women with abnormal uterine bleeding. J Clin Ultrasound 2000; 28: 217-23.
7. Valle RF. Office Hysteroscopy. In: Baggish MS, Valle RF, Guedi H, editors. Hysteroscopy: visual perspectives of uterine anatomy, physiology, and pathology. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2007: 213-25.
8. Grimbizis GF, Tsolakidis D, Mikos T, Anagnostou E, Asimakopoulos E, Stamatopoulos P, et al. A prospective comparison of transvaginal ultrasound, saline infusion sonohysterography, and diagnostic hysteroscopy in the evaluation of endometrial pathology. Fertil Steril 2010; 94: 2720-5.
9. Schwarzler P, Concin H, Bosch H, Berlinger A, Wohlgenannt K, Collins WP, et al. An evaluation of sonohysterography and diagnostic hysteroscopy for the assessment of intrauterine pathology. Ultrasound Obstet Gynecol 1998; 11: 337-42.
10. Farquhar C, Ekeroma A, Furness S, Arroll B. A systematic review of transvaginal ultrasonography, sonohysterography and hysteroscopy for the investigation of abnormal uterine bleeding in premenopausal women. Acta Obstet Gynecol Scand 2003; 82: 493-504.
11. Bingol B, Gunenc MZ, Gedikbasi A, Guner H, Tasdemir S, Tiras B. Comparison of diagnostic accuracy of saline infusion sonohysterography, transvaginal sonography and hysteroscopy in postmenopausal bleeding. Arch Gynecol Obstet 2011; 284: 111-7.
12. Loverro G, Nappi L, Vicino M, Carriero C, Vimercati A, Selvaggi L. Uterine cavity assessment in infertile women: comparison of transvaginal sonography and hysteroscopy. Eur J Obstet Gynecol Reprod Biol 2001; 100: 67-71.
13. Di Spiezio SA, Bettocchi S, Spinelli M, Guida M, Nappi L, Angioni S, et al. Review of new office-based hysteroscopic procedures 2003-2009. J Minim Invasive Gynecol 2010; 17: 436-48.

การเปรียบเทียบความแม่นยำในการตรวจวินิจฉัยติ่งเนื้อเยื่อบุโพรงมดลูกระหว่างวิธีการตรวจด้วยคลื่นเสียงความถี่สูงกับการตรวจ โพรงมดลูกผ่านกล้อง

อรัญญา ยันตพันธ์

วัตถุประสงค์: *เพื่อศึกษาเปรียบเทียบความแม่นยำในการตรวจติ่งเนื้อเยื่อบุโพรงมดลูกระหว่างคลื่นเสียงความถี่สูงและการตรวจโพรงมดลูกผ่านกล้อง*

วัสดุและวิธีการ: *เป็นการศึกษาแบบย้อนหลัง โดยการคัดเลือกผู้ป่วยที่ได้รับการวินิจฉัยว่าเป็นติ่งเนื้อเยื่อบุโพรงมดลูกจากผลทางพยาธิวิทยา ที่มารับการตรวจรักษาจากหน่วยผ่าตัดผ่านกล้องทางนรีเวชกลุ่มงานสูตินรีเวชศาสตร์ โรงพยาบาลราชวิถีในระหว่างเดือนมกราคม พ.ศ. 2548 ถึง เดือนธันวาคม พ.ศ. 2553 แล้วแยกกลุ่มผู้ป่วยที่ได้รับการตรวจทั้งสองวิธีอันได้แก่ วิธีการตรวจด้วยคลื่นเสียงความถี่สูงทางช่องคลอดและการตรวจโพรงมดลูกผ่านกล้อง หลังจากนั้นได้ทำการตัดชิ้นเนื้อส่งตรวจทางพยาธิวิทยา นำผลที่ได้มาเปรียบเทียบดูความแม่นยำของการตรวจทั้งสองวิธี*

ผลการศึกษา: *มีสตรีที่เข้าเกณฑ์การศึกษาจำนวน 60 คน อายุระหว่าง 31-40 ปี ได้รับการตรวจคลื่นเสียงความถี่สูงทางช่องคลอด มีความไวในการวินิจฉัยโรคร้อยละ 60 มีความจำเพาะในการวินิจฉัยร้อยละ 33.3 มีความแม่นยำร้อยละ 57.6 ขณะที่วิธีการตรวจด้วยกล้องผ่านโพรงมดลูก มีความไวในการวินิจฉัยโรค ร้อยละ 93.3 มีความจำเพาะในการวินิจฉัย ร้อยละ 33.3 มีความแม่นยำร้อยละ 87.9 เมื่อเปรียบเทียบวิธีการตรวจวินิจฉัยติ่งเนื้อเยื่อบุโพรงมดลูก ด้วยคลื่นเสียงความถี่สูงทางช่องคลอดกับการตรวจด้วยกล้องผ่านโพรงมดลูก พบว่าการตรวจด้วยกล้องผ่านโพรงมดลูก มีความไวในการตรวจและมีความแม่นยำสูงกว่าการตรวจด้วยคลื่นเสียงความถี่สูงทางช่องคลอดอย่างมีนัยสำคัญ ($p < 0.001$)*

สรุป: *การตรวจโพรงมดลูกผ่านกล้องมีความไว และความแม่นยำกว่าการตรวจด้วยคลื่นเสียงความถี่สูงในการวินิจฉัยติ่งเนื้อเยื้อบุโพรงมดลูก*